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Search Results -

Terms	Documents
(cyclo-malto-dextrin glucano-transferase)	6

Database: US Patents Full-Text Database; US Pre-Grant Publication Full-Text Database; JPO Abstracts Database; EPO Abstracts Database; Derwent World Patents Index; IBM Technical Disclosure Bulletins

Search: L7

Refine Search

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Search History

DATE: Tuesday, December 31, 2002 Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
DB=USPT,PGPB,JPAB,EPAB,DWPI; PLUR=YES; OP=ADJ			
L7	(cyclo-malto-dextrin glucano-transferase)	6	L7
L6	L5 and (47cys, 47asp, 47glu, 47phe, 47gly, 47ile, 47lys, 47asn, 47pro, 47arg, 47ser, 47thr, 47val, 47trp, 47tyr)	0	L6
L5	L1 same bacillus	114	L5
L4	L2 and (47C, 47D, 47E, 47F, 47G, 47I, 47K, 47N, 47P, 47R, 47S, 47T, 47V, 47W, 47Y)	2	L4
L3	L2 same (47C, 47D, 47E, 47F, 47G, 47I, 47K, 47N, 47P, 47R, 47S, 47T, 47V, 47W, 47Y)	0	L3
L2	L1 same (mutant or variant)	27	L2
L1	CGTase	249	L1

END OF SEARCH HISTORY

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Search Results - Record(s) 1 through 6 of 6 returned.

☐ 1. Document ID: US 20010033838 A1

L7: Entry 1 of 6 File: PGPB Oct 25, 2001

PGPUB-DOCUMENT-NUMBER: 20010033838
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20010033838 A1

TITLE: Use of emu oil and its various fractions as a carrier for antifungal, antibacterial, and antiviral medications & preperations

PUBLICATION-DATE: October 25, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Farmer, Sean	La Jolla	CA	US	

US-CL-CURRENT: 424/115; 424/522, 424/780

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

☐ 2. Document ID: US 6461607 B1

L7: Entry 2 of 6 File: USPT Oct 8, 2002

US-PAT-NO: 6461607
DOCUMENT-IDENTIFIER: US 6461607 B1

TITLE: Probiotic, lactic acid-producing bacteria and uses thereof

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

☐ 3. Document ID: JP 09003089 A

L7: Entry 3 of 6 File: DWPI Jan 7, 1997

DERWENT-ACC-NO: 1997-115277
DERWENT-WEEK: 199711
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TITLE: New polyphenol glycoside - prepd. using cyclo-malto-dextrin glucano-transferase, useful for isolating polyphenol(s) in vivo

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Clip Img | Image

☐ 4. Document ID: JP 07023781 A

L7: Entry 4 of 6 File: DWPI Jan 27, 1995

DERWENT-ACC-NO: 1995-100943
DERWENT-WEEK: 199514

TITLE: Modified cyclo-malto-dextrin glucano-transferase and corresp. gene - useful in the prodn. of gamma-dextrin

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Clip Img | Image

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☐ 5. Document ID: JP 05163130 A

L7: Entry 5 of 6 File: DWPI Jun 29, 1993

DERWENT-ACC-NO: 1993-239908
DERWENT-WEEK: 199330

TITLE: Novel cosmetic, contg. water-soluble transglycosidated flavonoid - contains trans-glycosidated flavanoid, using catalyst of cyclo-malto-dextrin glucano-transferase, giving antibacterial action

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☐ 6. Document ID: EP 327099 A DE 68909625 E DK 8900508 A EP 327099 B1 JP 01199575 A US 5019507 A US 5102800 A

L7: Entry 6 of 6 File: DWPI Aug 9, 1989

DERWENT-ACC-NO: 1989-229144
DERWENT-WEEK: 198932

TITLE: New cyclo-malto-dextrin glucano-transferase - obtd. from novel Bacillus coagulans strain, used for producing cyclodextrin cpds. from starch

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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Generate Collection | Print

Terms	Documents
(cyclo-malto-dextrin glucano-transferase)	6

Display Format: - Change Format

WEST

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Search Results - Record(s) 1 through 27 of 27 returned.

☐ 1. Document ID: US 20020155574 A1

L2: Entry 1 of 27 File: PGPB Oct 24, 2002

PGPUB-DOCUMENT-NUMBER: 20020155574
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020155574 A1

TITLE: Alpha-amylase mutants with altered properties

PUBLICATION-DATE: October 24, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Thisted, Thomas	Rungsted Kyst		DK	
Kjaerulff, Soren	Vanlose		DK	
Andersen, Carsten	Vaerloese		DK	
Fuglsang, Claus Crone	Niva		DK	

US-CL-CURRENT: 435/202; 435/203, 435/320.1, 435/325, 435/69.1

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

☐ 2. Document ID: US 20020098996 A1

L2: Entry 2 of 27 File: PGPB Jul 25, 2002

PGPUB-DOCUMENT-NUMBER: 20020098996
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020098996 A1

TITLE: Amylase variants

PUBLICATION-DATE: July 25, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Bisgard-Frantzen, Henrik	Lyngby		DK	
Svendsen, Allan	Birkeroed		DK	
Borchert, Torben Vedel	Copenhagen N		DK	

US-CL-CURRENT: 510/392

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

☐ 3. Document ID: US 20020042120 A1

L2: Entry 3 of 27 File: PGPB Apr 11, 2002

PGPUB-DOCUMENT-NUMBER: 20020042120
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020042120 A1

TITLE: Novel cyclomaltodextrin glucanotransferase variants

PUBLICATION-DATE: April 11, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Andersen, Carsten	Vaerlose		DK	
Nielsen, Bjarne Ronfeldt	Virum		DK	
Dijkhuizen, Lubbert	Haren		NL	
Dijkstra, Bauke	Haren		NL	

US-CL-CURRENT: 435/221; 435/252.3, 435/320.1, 536/23.2

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☐ 4. Document ID: US 20020032142 A1

L2: Entry 4 of 27 File: PGPB Mar 14, 2002

PGPUB-DOCUMENT-NUMBER: 20020032142
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020032142 A1

TITLE: Detergent compositions comprising a cyclodextrin glucanotransferase enzyme and a detergent ingredient

PUBLICATION-DATE: March 14, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Smets, Johan	Lubbeek		BE	
Pintens, An	Merksem		BE	

US-CL-CURRENT: 510/305; 510/311, 510/312, 510/392

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☐ 5. Document ID: US 6482622 B1

L2: Entry 5 of 27 File: USPT Nov 19, 2002

US-PAT-NO: 6482622
DOCUMENT-IDENTIFIER: US 6482622 B1

TITLE: Amylolytic enzyme variants

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☐ 6. Document ID: US 6472192 B1

L2: Entry 6 of 27 File: USPT Oct 29, 2002

US-PAT-NO: 6472192
DOCUMENT-IDENTIFIER: US 6472192 B1

TITLE: Cyclodextrin glycosyl transferases for producing .gamma.-cyclodextrin

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

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☐ 7. Document ID: US 6297038 B1

L2: Entry 7 of 27 File: USPT Oct 2, 2001

US-PAT-NO: 6297038
DOCUMENT-IDENTIFIER: US 6297038 B1

TITLE: Amylase variants

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

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☐ 8. Document ID: US 6271010 B1

L2: Entry 8 of 27 File: USPT Aug 7, 2001

US-PAT-NO: 6271010
DOCUMENT-IDENTIFIER: US 6271010 B1

TITLE: Cyclomaltodextrin glucanotransferase variants

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

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☐ 9. Document ID: US 6162628 A

L2: Entry 9 of 27 File: USPT Dec 19, 2000

US-PAT-NO: 6162628
DOCUMENT-IDENTIFIER: US 6162628 A

TITLE: Maltogenic alpha-amylase variants

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

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☐ 10. Document ID: US 6093562 A

L2: Entry 10 of 27 File: USPT Jul 25, 2000

US-PAT-NO: 6093562
DOCUMENT-IDENTIFIER: US 6093562 A

TITLE: Amylase variants

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☑ 11. Document ID: US 6004790 A

L2: Entry 11 of 27 File: USPT Dec 21, 1999

US-PAT-NO: 6004790
DOCUMENT-IDENTIFIER: US 6004790 A

TITLE: Cyclomaltodextrin glucanotransferase variants

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☐ 12. Document ID: US 5925544 A

L2: Entry 12 of 27 File: USPT Jul 20, 1999

US-PAT-NO: 5925544
DOCUMENT-IDENTIFIER: US 5925544 A

TITLE: Method of homologous recombination followed by in vivo selection of DNA amplification

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☐ 13. Document ID: US 5919895 A

L2: Entry 13 of 27 File: USPT Jul 6, 1999

US-PAT-NO: 5919895
DOCUMENT-IDENTIFIER: US 5919895 A

TITLE: Secretion of hirudin derivatives

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☑ 14. Document ID: US 5804426 A

L2: Entry 14 of 27 File: USPT Sep 8, 1998

US-PAT-NO: 5804426
DOCUMENT-IDENTIFIER: US 5804426 A

TITLE: Recombinant cyclodextran glucanotransferase mutants

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☐ 15. Document ID: US 5733753 A

L2: Entry 15 of 27 File: USPT Mar 31, 1998

US-PAT-NO: 5733753

DOCUMENT-IDENTIFIER: US 5733753 A

TITLE: Amplification of genomic DNA by site specific integration of a selectable marker construct

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☐ 16. Document ID: US 5635378 A

L2: Entry 16 of 27 File: USPT Jun 3, 1997

US-PAT-NO: 5635378
DOCUMENT-IDENTIFIER: US 5635378 A

TITLE: Variant-type carbohydrate hydrolase, variant gene of the enzyme and method for producing oligosaccharide using the enzyme

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☐ 17. Document ID: US 5631149 A

L2: Entry 17 of 27 File: USPT May 20, 1997

US-PAT-NO: 5631149
DOCUMENT-IDENTIFIER: US 5631149 A

TITLE: Variant-type carbohydrate hydrolase, variant gene of the enzyme and method for producing oligosaccharide using the enzyme

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☐ 18. Document ID: US 5538882 A

L2: Entry 18 of 27 File: USPT Jul 23, 1996

US-PAT-NO: 5538882
DOCUMENT-IDENTIFIER: US 5538882 A

TITLE: Variant-type carbohydrate hydrolase, variant gene of the enzyme and method for producing oligosaccharide using the enzyme

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☑ 19. Document ID: US 5474917 A

L2: Entry 19 of 27 File: USPT Dec 12, 1995

US-PAT-NO: 5474917
DOCUMENT-IDENTIFIER: US 5474917 A

TITLE: Modified cyclodextrin glycosyltransferases for producing .gamma.-cyclodextrins

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

☑ 20. Document ID: US 5409824 A

L2: Entry 20 of 27 File: USPT Apr 25, 1995

US-PAT-NO: 5409824
DOCUMENT-IDENTIFIER: US 5409824 A

TITLE: .gamma.-CGTase

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

☐ 21. Document ID: US 5376537 A

L2: Entry 21 of 27 File: USPT Dec 27, 1994

US-PAT-NO: 5376537
DOCUMENT-IDENTIFIER: US 5376537 A

TITLE: Process for production of cyclodextrins

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

☑ 22. Document ID: JP 10033187 A

L2: Entry 22 of 27 File: JPAB Feb 10, 1998

PUB-NO: JP410033187A
DOCUMENT-IDENTIFIER: JP 10033187 A
TITLE: CGTASE, PRODUCTION OF MUTANT CGTASE GENE, DNA-SEQUENCE CODING CGTASE, PRODUCTION OF GAMMA-CGTASE, PRODUCTION OF GAMMA-CD

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

☐ 23. Document ID: WO 9943793 A1

L2: Entry 23 of 27 File: EPAB Sep 2, 1999

PUB-NO: WO009943793A1
DOCUMENT-IDENTIFIER: WO 9943793 A1
TITLE: AMYLOLYTIC ENZYME VARIANTS

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

☑ 24. Document ID: WO 9633267 A1

L2: Entry 24 of 27 File: EPAB Oct 24, 1996

PUB-NO: WO009633267A1
DOCUMENT-IDENTIFIER: WO 9633267 A1
TITLE: CYCLOMALTODEXTRIN GLUCANOTRANSFERASE VARIANTS

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

☐ 25. Document ID: US 6482622 B1 WO 9943793 A1 AU 9925128 A EP 1066374 A1 CN 1292028 A

L2: Entry 25 of 27 File: DWPI Nov 19, 2002

DERWENT-ACC-NO: 1999-540583
DERWENT-WEEK: 200280

TITLE: New variants of maltogenic alpha-amylase or cyclodextrin glucanotransferase and their hybrids, used as anti-staling additives for bread and for production of cyclodextrins

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

☑ 26. Document ID: WO 9633267 A1 KR 99007930 A AU 9653968 A EP 822982 A1 JP 11503906 W US 6004790 A

L2: Entry 26 of 27 File: DWPI Oct 24, 1996

DERWENT-ACC-NO: 1996-485774
DERWENT-WEEK: 200014

TITLE: New variants of cyclo:malto:dextrin glucanotransferase (CGTase) - have altered substrate binding, useful for prodn. of cyclodextrin(s) or linear oligosaccharide(s), opt. formed in situ in e.g. baked goods

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Clip Img | Image

☐ 27. Document ID: EP 481903 A CA 2053624 A ES 2052462 T1 FR 2668163 A1 HU 60527 T US 5376537 A

L2: Entry 27 of 27 File: DWPI Apr 22, 1992

DERWENT-ACC-NO: 1992-134156
DERWENT-WEEK: 199217

TITLE: Prepn. of beta and gamma cyclodextrin(s) - by reaction of starch with cyclodextrin:glycosyl:transferase obtained from Bacillus ohbensis

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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Terms	Documents
L1 same (mutant or variant)	27

Display Format: - Change Format

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=> d his

     (FILE 'HOME' ENTERED AT 12:54:56 ON 31 DEC 2002)

     INDEX 'ADISCTI, ADISINSIGHT, ADISNEWS, AGRICOLA, ANABSTR, AQUASCI,
     BIOBUSINESS, BIOCOMMERCE, BIOSIS, BIOTECHABS, BIOTECHDS, BIOTECHNO, CABA,
     CANCERLIT, CAPLUS, CEABA-VTB, CEN, CIN, CONFSCI, CROPB, CROPU, DDFB,
     DDFU, DGENE, DRUGB, DRUGLAUNCH, DRUGMONOG2, ...' ENTERED AT 12:55:05 ON
     31 DEC 2002
               SEA (CYCLOMALTODEXTRIN GLUCANOTRANSFERASE) OR (CGTASE)
               ---------
              36   FILE AGRICOLA
               6   FILE ANABSTR
               2   FILE AQUASCI
              81   FILE BIOBUSINESS
             296   FILE BIOSIS
             466   FILE BIOTECHABS
             466   FILE BIOTECHDS
             208   FILE BIOTECHNO
              40   FILE CABA
             551   FILE CAPLUS
              86   FILE CEABA-VTB
               2   FILE CEN
               3   FILE CIN
               3   FILE CONFSCI
               7   FILE DDFU
             268   FILE DGENE
               7   FILE DRUGU
               1   FILE EMBAL
             257   FILE EMBASE
             124   FILE ESBIOBASE
              42   FILE FROSTI
             218   FILE FSTA
             147   FILE GENBANK
              44   FILE IFIPAT
             117   FILE JICST-EPLUS
             174   FILE LIFESCI
             203   FILE MEDLINE
             247   FILE PASCAL
               1   FILE PHIN
               9   FILE PROMT
             277   FILE SCISEARCH
              78   FILE TOXCENTER
             213   FILE USPATFULL
               1   FILE USPAT2
             112   FILE WPIDS
             112   FILE WPINDEX
L1              QUE (CYCLOMALTODEXTRIN GLUCANOTRANSFERASE) OR (CGTASE)
                ---------

     FILE 'CAPLUS, BIOTECHDS, BIOSIS, SCISEARCH, EMBASE, PASCAL, FSTA,
     BIOTECHNO, MEDLINE' ENTERED AT 12:59:57 ON 31 DEC 2002
L2           542 S L1 AND (VARIANT OR MUTANT OR RECOMBINANT)
L3             1 S L2 AND (47D OR 47C OR 47E OR 47F OR 47G OR 47I OR 47K OR 47N
L4           432 S L2 AND BACILLUS
L5            12 S L4 AND 47
L6             7 DUP REM L5 (5 DUPLICATES REMOVED)
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=> d l6 ibib ab 1-6

L6 ANSWER 1 OF 7 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 1
ACCESSION NUMBER: 2000:446340 CAPLUS
DOCUMENT NUMBER: 133:101286
TITLE: The role of arginine **47** in the cyclization and coupling reactions of cyclodextrin glycosyltransferase from **Bacillus** circulans strain 251 implications for product inhibition and product specificity
AUTHOR(S): Van der Veen, Bart A.; Uitdehaag, Joost C. M.; Dijkstra, Bauke W.; Dijkhuizen, Lubbert
CORPORATE SOURCE: Department of Microbiology, Groningen Biomolecular Sciences and Biotechnology Institute (GBB), University of Groningen, Haren, 9751 NN, Neth.
SOURCE: European Journal of Biochemistry (2000), 267(12), 3432-3441
CODEN: EJBCAI; ISSN: 0014-2956
PUBLISHER: Blackwell Science Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Cyclodextrin glycosyltransferase (**CGTase**; EC 2.4.1.19) is used for the industrial prodn. of cyclodextrins. Its application, however, is hampered by the limited cyclodextrin product specificity and the strong inhibitory effect of cyclodextrins on **CGTase** activity. Recent structural studies have identified Arg-**47** in B. circulans strain 251 **CGTase** as an active site residue interacting with cyclodextrins, but not with linear oligosaccharides. Thus, Arg-**47** may specifically affect **CGTase** reactions with cyclic substrates or products. Here, the authors show that mutations in Arg-**47** (to Leu or Gln) indeed have a neg. effect on the cyclization and coupling activities; Arg-**47** specifically stabilizes the oligosaccharide chain in the transition state for these reactions. As a result, the **mutant** proteins displayed a shift in product specificity toward the formation of larger cyclodextrins. As expected, both **mutants** also showed lower affinities for cyclodextrins in the coupling reaction, and a reduced competitive (product) inhibition of the disproportionation reaction by cyclodextrins. Both **mutants** also provided valuable information about the processes taking place during cyclodextrin prodn. assays. **Mutant** R47L displayed an increased hydrolyzing activity, causing accumulation of increasing amts. of short oligosaccharides in the reaction mixt., which resulted in lower final amts. of cyclodextrins produced from starch. Interestingly, **mutant** R47Q displayed an increased ratio of cyclization/coupling and a decreased hydrolyzing activity. Due to the decreased coupling activity, which esp. affects the prodn. of larger cyclodextrins, this **CGTase variant** produced the various cyclodextrins in a stable ratio in time. This feature is very promising for the industrial application of **CGTases** with improved product specificity.
REFERENCE COUNT: 51 THERE ARE 51 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 2 OF 7 FSTA COPYRIGHT 2002 IFIS
ACCESSION NUMBER: 2000(12):B1957 FSTA
TITLE: The role of arginine **47** in the cyclization and coupling reactions of cyclodextrin glycosyltransferase from **Bacillus** circulans strain 251. Implications for product inhibition and product specificity.
AUTHOR: Veen, B. A. van der; Uitdehaag, J. C. M.; Dijkstra, B. W.; Dijkhuizen, L.
CORPORATE SOURCE: Correspondence (Reprint) address, L. Dijkhuizen, Dep. of Microbiol., Groningen Biomolecular Sci. & Biotech.

Inst. (GBB), Univ. of Groningen, 9751 NN Haren, Netherlands. Tel. +31 50 3632150. Fax +31 50 3632154. E-mail L.Dijkhuizen(a)biol.rug.nl

SOURCE: European Journal of Biochemistry, (2000) 267 (12) 3432-3441, 51 ref.
ISSN: 0014-2956

DOCUMENT TYPE: Journal
LANGUAGE: English

AB Cyclodextrin glycosyltransferase (**CGTase**; **cyclomaltodextrin glucanotransferase**; EC 2.4.1.19) is used for industrial production of cyclodextrins for applications including encapsulation of food flavourings. Its application, however, is hampered by limited cyclodextrin product specificity and the strong inhibitory effect of cyclodextrins on **CGTase** activity. Recent structural studies have identified Arg47 in **Bacillus** circulans strain 251 **CGTase** as an active-site residue interacting with cyclodextrins, but not with linear oligosaccharides. Thus, Arg47 may specifically affect **CGTase** reactions with cyclic substrates or products. Mutations of Arg47 (to Leu or Gln) were shown to have a negative effect on cyclization and coupling activities; Arg47 specifically stabilized the oligosaccharide chain in the transition state for these reactions. As a result, **mutant** proteins displayed a shift in product specificity towards formation of larger cyclodextrins. As expected, both **mutants** also showed lower affinities for cyclodextrins in the coupling reaction, and reduced competitive (product) inhibition of the disproportionation reaction by cyclodextrins. Both **mutants** provided valuable information about processes taking place during cyclodextrin production assays. **Mutant** Arg47Leu displayed increased hydrolysing activity, causing accumulation of increasing amounts of short oligosaccharides in the reaction mixture, which resulted in lower final amounts of cyclodextrins produced from starch. Interestingly, **mutant** Arg47Gln displayed an increased ratio of cyclization/coupling reactions and decreased hydrolysing activity. Due to the decreased coupling activity, which especially affected production of larger cyclodextrins, this **CGTase variant** produced various cyclodextrins in a stable ratio. It is suggested that this feature is promising for industrial application of **CGTase** enzymes with improved product specificity.

L6 ANSWER 3 OF 7 BIOTECHDS COPYRIGHT 2002 THOMSON DERWENT AND ISI
ACCESSION NUMBER: 1999-08460 BIOTECHDS
TITLE: **Cyclomaltodextrin-glucanotransferase variants** of increased product specificity; **recombinant cyclomaltodextrin-glucanotransferase variant** used in the production of cyclodextrin isoforms
AUTHOR: Andersen C; Nielsen B R; Dijkhuizen L; Dijkstra B
PATENT ASSIGNEE: Novo-Nordisk
LOCATION: Bagsvaerd, Denmark.
PATENT INFO: WO 9915633 1 Apr 1999
APPLICATION INFO: WO 1998-DK412 23 Sep 1998
PRIORITY INFO: US 1997-62659 8 Oct 1997; DK 1997-1098 24 Sep 1997
DOCUMENT TYPE: Patent
LANGUAGE: English
OTHER SOURCE: WPI: 1999-263478 [22]

AB **Cyclomaltodextrin-glucanotransferase** (EC-2.4.1.19, CTGase) **variants** with an increased product specificity are claimed. The CTGase **variants** have specific amino acid alterations at one or more of positions **47**, 145, 146, 147, 196 and 371. These **variants** are used in the production of alpha-, beta- or gamma-cyclodextrins (CD) which are used in food, chemicals, cosmetics and pharmaceuticals. The CD form inclusion bodies with small hydrophobic molecules resulting in increased solubility and stability, and a reduced reactivity and volatility. The CTGase **variants**

have an increased specificity for specific CD isoforms which will decrease cost and environmental hazards associated with other procedures for CD separation. The CTGase **variants** were derived from **Bacillus** sp., Brevibacterium sp., Clostridium sp., Corynebacterium sp., Klebsiella sp., Micrococcus sp., Thermoanaerobium sp., Thermoanaerobacterium sp., Thermoanaerobacter sp., and Thermoactinomyces sp., especially **Bacillus** circulans 251 and Thermoanaerobacter sp. ATCC 53627, and were produced by **recombinant** expression in Escherichia coli PC1990 using plasmid pCT2. (40pp)

L6 ANSWER 4 OF 7 MEDLINE
ACCESSION NUMBER: 1999241045 MEDLINE
DOCUMENT NUMBER: 99241045 PubMed ID: 10222200
TITLE: Crystal structure of Thermoactinomyces vulgaris R-**47** alpha-amylase II (TVAII) hydrolyzing cyclodextrins and pullulan at 2.6 A resolution.
AUTHOR: Kamitori S; Kondo S; Okuyama K; Yokota T; Shimura Y; Tonozuka T; Sakano Y
CORPORATE SOURCE: Department of Biotechnology and Life Science, Faculty of Technology, Tokyo University of Agriculture and Technology, Koganei, Tokyo, 184-8588,. Japan.kamitori@cc.tuat.ac.jp
SOURCE: JOURNAL OF MOLECULAR BIOLOGY, (1999 Apr 16) 287 (5) 907-21. Journal code: 2985088R. ISSN: 0022-2836.
PUB. COUNTRY: ENGLAND: United Kingdom
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
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OTHER SOURCE: PDB-1BVZ; PDB-1BVZSF
ENTRY MONTH: 199905
ENTRY DATE: Entered STN: 19990601
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AB The crystal structure of Thermoactinomyces vulgaris R-**47** alpha-Amylase II (TVAII) has been determined by multiple isomorphous replacement at 2.6 A resolution. TVAII was crystallized in an orthorhombic system with the space group P212121 and the cell dimensions a=118.5 A, b=119.5 A, c=114.5 A. There are two molecules in an asymmetric unit, related by the non-crystallographic 2-fold symmetry. Diffraction data were collected at 113 K and the cell dimensions reduced to a=114.6 A, b=117.9 A, c=114.2 A, and the model was refined against 7.0-2.6 A resolution data giving an R-factor of 0.204 (Rfree=0.272). The final model consists of 1170 amino acid residues (two molecules) and 478 water molecules with good chemical geometry. TVAII has three domains, A, B, and C, like other alpha-amylases. Domain A with a (beta/alpha)8 barrel structure and domain C with a beta-sandwich structure are very similar to those found in other alpha-amylases. Additionally, TVAII has an extra domain N composed of 121 amino acid residues at the N-terminal site, which has a beta-barrel-like structure consisting of seven antiparallel beta-strands. Domain N is one of the driving forces in the formation of the dimer structure of TVAII, but its role in the enzyme activity is still not clear. TVAII does not have the Ca2+ binding site that connects domains A and B in other alpha-amylases, rather the NZ atom of Lys299 of TVAII serves as the connector between these domains. TVAII can hydrolyze cyclodextrins and pullulan as well as starch. Based on a structural comparison with the complex between a **mutant** cyclodextrin glucanotransferase and a beta-cyclodextrin derivative, Phe286 located at domain B is considered the residue most likely to recognize the hydrophobic cavity of cyclodextrins. The active-site cleft of TVAII is wider and shallower than that of other alpha-amylases, and seems to be suitable for the binding of pullulan which is expected not to adopt the helical structure of amylose.

L6 ANSWER 5 OF 7 BIOTECHDS COPYRIGHT 2002 THOMSON DERWENT AND ISI

ACCESSION NUMBER: 1997-06731 BIOTECHDS
TITLE: Production of cyclodextrin using raw corn starch without a pretreatment;
and thermostable enzyme, **cyclomaltodextrin-glucanotransferase**
AUTHOR: Kim T J; Kim B C; Lee H S
CORPORATE SOURCE: Samyang-Genex
LOCATION: Food Application Labarotory, Sam Yang Genex Research Institute, 63-2, Hwaam-dong, Yusung-gu, Taejeon, 305-48, South Korea.
SOURCE: Enzyme Microb.Technol.; (1997) 20, 7, 506-09
CODEN: EMTED2
ISSN: 0141-0229
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A much improved cyclodextrin-producing method was investigated. Thermostable **cyclomaltodextrin-glucanotransferase** (**CGTase**, EC-2.4.1.19), obtained from a Thermoanaerobacter sp., was expressed in and produced by a selected strain of **Bacillus** sp. The optimum temp. was 90 deg, and pH was 5.0-6.5. Corn starch was incubated with the enzyme without any pretreatment. This method meant that there was no degradation of the cyclodextrins produced, the enzyme was used efficiently and the residual substrate was removed by a physical method. The residual substrate could be used for other products. The conditions for the production of cyclodextrins were: substrate, corn starch; optimum reaction temp. of 65 deg; substrate concentration was 7.5%; and enzyme concentration, 22 U/g starch. The conversion of substrate to cyclodextrin and maltodextrin was 27.9 and 31.4%, respectively, with 40.7% substrate remaining. After the removal of residual starch, the final product contained **47%** of cyclodextrin. (9 ref)

L6 ANSWER 6 OF 7 BIOTECHDS COPYRIGHT 2002 THOMSON DERWENT AND ISI
ACCESSION NUMBER: 1993-03698 BIOTECHDS
TITLE: Development of a **Bacillus** brevis host-vector system for efficient heterologous protein production and its application to protein engineering;
amylase, **cyclomaltodextrin-glucanotransferase**, pepsinogen and epidermal growth factor gene cloning in protease-deficient host using plasmid pNU200 and plasmid pHY700 (conference paper)
AUTHOR: Yamagata H
LOCATION: Department of Food Science and Technology, Faculty of Agriculture, Nagoya University, Chikusa-ku, Nagoya 464, Japan.
SOURCE: Biochem.Eng.2001; (1992) 21-26
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A host-vector system using **Bacillus** brevis was developed. The strain had very low extracellular protease activity, and produced extracellular proteins in large amounts, making it a promising host for heterologous protein production. B. brevis **47** and HPD31 were used as hosts, and plasmid pNU200 and plasmid pHY700 were used as vectors. Many bacterial proteins, e.g. thermostable alpha-amylase (EC-3.2.1.1) from **Bacillus** licheniformis or **Bacillus** stearothermophilus, **cyclomaltodextrin-glucanotransferase** (EC-2.4.1.19) from **Bacillus** macerans and beta-amylase (EC-3.2.1.2) from Clostridium thermosulfurogenes were produced at 1.0-3.5 g/l culture using this system. Eukaryotic proteins (e.g. Taka-amylase-A, pepsinogen and salivary amylase) were produced at lower levels (more than 10-fold smaller, except for human epidermal growth factor which was produced at 1.1 g/l), but levels were still higher than those using other bacterial systems. A **mutant** (B. brevis 47K) producing increased amounts of human **recombinant**

salivary alpha-amylase was isolated. (17 ref)

=> d l3 ibib ab

L3 ANSWER 1 OF 1 BIOTECHDS COPYRIGHT 2002 THOMSON DERWENT AND ISI
ACCESSION NUMBER: 1993-03698 BIOTECHDS
TITLE: Development of a Bacillus brevis host-vector system for efficient heterologous protein production and its application to protein engineering;
amylase, **cyclomaltodextrin-glucanotransferase**, pepsinogen and epidermal growth factor gene cloning in protease-deficient host using plasmid pNU200 and plasmid pHY700 (conference paper)
AUTHOR: Yamagata H
LOCATION: Department of Food Science and Technology, Faculty of Agriculture, Nagoya University, Chikusa-ku, Nagoya 464, Japan.
SOURCE: Biochem.Eng.2001; (1992) 21-26
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A host-vector system using Bacillus brevis was developed. The strain had very low extracellular protease activity, and produced extracellular proteins in large amounts, making it a promising host for heterologous protein production. B. brevis 47 and HPD31 were used as hosts, and plasmid pNU200 and plasmid pHY700 were used as vectors. Many bacterial proteins, e.g. thermostable alpha-amylase (EC-3.2.1.1) from Bacillus licheniformis or Bacillus stearothermophilus, **cyclomaltodextrin -glucanotransferase** (EC-2.4.1.19) from Bacillus macerans and beta-amylase (EC-3.2.1.2) from Clostridium thermosulfurogenes were produced at 1.0-3.5 g/l culture using this system. Eukaryotic proteins (e.g. Taka-amylase-A, pepsinogen and salivary amylase) were produced at lower levels (more than 10-fold smaller, except for human epidermal growth factor which was produced at 1.1 g/l), but levels were still higher than those using other bacterial systems. A **mutant** (B. brevis **47K**) producing increased amounts of human **recombinant** salivary alpha-amylase was isolated. (17 ref)

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Search Results - Record(s) 1 through 2 of 2 returned.

☐ 1. Document ID: US 20020042120 A1

L4: Entry 1 of 2 File: PGPB Apr 11, 2002

PGPUB-DOCUMENT-NUMBER: 20020042120
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020042120 A1

TITLE: Novel cyclomaltodextrin glucanotransferase variants

PUBLICATION-DATE: April 11, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Andersen, Carsten	Vaerlose		DK	
Nielsen, Bjarne Ronfeldt	Virum		DK	
Dijkhuizen, Lubbert	Haren		NL	
Dijkstra, Bauke	Haren		NL	

US-CL-CURRENT: 435/221; 435/252.3, 435/320.1, 536/23.2

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

☐ 2. Document ID: US 6271010 B1

L4: Entry 2 of 2 File: USPT Aug 7, 2001

US-PAT-NO: 6271010
DOCUMENT-IDENTIFIER: US 6271010 B1

TITLE: Cyclomaltodextrin glucanotransferase variants

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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Terms	Documents
L2 and (47C, 47D, 47E, 47F, 47G, 47I, 47K, 47N, 47P, 47R, 47S, 47T, 47V, 47W, 47Y)	2

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Terms	Documents
L2 and (47C, 47D, 47E, 47F, 47G, 47I, 47K, 47N, 47P, 47R, 47S, 47T, 47V, 47W, 47Y)	2

Database: US Patents Full-Text Database; US Pre-Grant Publication Full-Text Database; JPO Abstracts Database; EPO Abstracts Database; Derwent World Patents Index; IBM Technical Disclosure Bulletins

Search: L4

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DATE: Tuesday, December 31, 2002 Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
	DB=USPT,PGPB,JPAB,EPAB,DWPI; PLUR=YES; OP=ADJ		
L4	L2 and (47C, 47D, 47E, 47F, 47G, 47I, 47K, 47N, 47P, 47R, 47S, 47T, 47V, 47W, 47Y)	2	L4
L3	L2 same (47C, 47D, 47E, 47F, 47G, 47I, 47K, 47N, 47P, 47R, 47S, 47T, 47V, 47W, 47Y)	0	L3
L2	L1 same (mutant or variant)	27	L2
L1	CGTase	249	L1

END OF SEARCH HISTORY

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Search Results -

Terms	Documents
L5 and (47cys, 47asp, 47glu, 47phe, 47gly, 47ile, 47lys, 47asn, 47pro, 47arg, 47ser, 47thr, 47val, 47trp, 47tyr)	0

Database: US Patents Full-Text Database; US Pre-Grant Publication Full-Text Database; JPO Abstracts Database; EPO Abstracts Database; Derwent World Patents Index; IBM Technical Disclosure Bulletins

Search: L6

Refine Search

Recall Text | Clear

Search History

DATE: Tuesday, December 31, 2002 Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
	DB=USPT,PGPB,JPAB,EPAB,DWPI; PLUR=YES; OP=ADJ		
L6	L5 and (47cys, 47asp, 47glu, 47phe, 47gly, 47ile, 47lys, 47asn, 47pro, 47arg, 47ser, 47thr, 47val, 47trp, 47tyr)	0	L6
L5	L1 same bacillus	114	L5
L4	L2 and (47C, 47D, 47E, 47F, 47G, 47I, 47K, 47N, 47P, 47R, 47S, 47T, 47V, 47W, 47Y)	2	L4
L3	L2 same (47C, 47D, 47E, 47F, 47G, 47I, 47K, 47N, 47P, 47R, 47S, 47T, 47V, 47W, 47Y)	0	L3
L2	L1 same (mutant or variant)	27	L2
L1	CGTase	249	L1

END OF SEARCH HISTORY

L7: Entry 4 of 6 File: DWPI Jan 27, 1995

DERWENT-ACC-NO: 1995-100943
DERWENT-WEEK: 199514

TITLE: Modified cyclo-malto-dextrin glucano-transferase and corresp. gene - useful in the prodn. of gamma-dextrin

PATENT-ASSIGNEE:

ASSIGNEE	CODE
OJI CORN STARCH CO LTD	OJIP

PRIORITY-DATA: 1993JP-0155117 (June 25, 1993)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
JP 07023781 A	January 27, 1995		010	C12N009/10

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
JP 07023781A	June 25, 1993	1993JP-0155117	

INT-CL (IPC): C12 N 9/10; C12 N 15/54; C12 P 19/18; C12 N 9/10; C12 R 1:19; C12 N 15/54; C12 R 1:07

ABSTRACTED-PUB-NO: JP 07023781A
BASIC-ABSTRACT:

A cyclomaltodextrin glucanotransferase (CGTase) in which tyrosine or phenylalanine at position 56 (when histidine of A region is defined to be first position) is replaced by leucine or valine is new. Also claimed are (1) a method for the prepn. of the above modified CGTase in which a host transformed by an expression vector contg. a DNA encoding the modified CGTase is cultured and the modified CGTase is collected from the culture, (2) a gene coding the above modified CGTase, and (3) a method for the prepn. of gamma-cyclodextrin in which the above modified CGTase is reacted with starch and gamma-dextrin is sepd. from the reaction liquid.

ADVANTAGE - The method can form gamma-dextrin at a ratio of 70% based on the total cyclodextrin.

CHOSEN-DRAWING: Dwg.0/1

TITLE-TERMS: MODIFIED CYCLO MALTO DEXTRIN TRANSFERASE CORRESPOND GENE USEFUL PRODUCE GAMMA DEXTRIN

DERWENT-CLASS: B04 D21

CPI-CODES: B04-C02B1; B04-E01; B04-L04; D05-C03D; D05-C08; D05-H12B; D05-H17B3;

CHEMICAL-CODES:

Chemical Indexing M1 *01*

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    Fragmentation Code
    M423 M710 M720 M903 V500 V540 V753 V802 V812

Chemical Indexing M1 *02*
    Fragmentation Code
    M423 M720 M903 M904 M910 N131 N134 N135 Q233 V0
    V722
    Specfic Compounds
    04818P
    Registry Numbers
    1856P
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UNLINKED-DERWENT-REGISTRY-NUMBERS: 1856P

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SECONDARY-ACC-NO:
CPI Secondary Accession Numbers: C1995-045772
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